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PROGRAM-CONTROLLED WASHER/DRYER
[Programmgesteuerter Waschtrockner]

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Description

The invention concerns a program-controlled washer/dryer with a suds container in which a drum for holding clothes is supported so that it can turn, with a air duct and condensation duct, arranged between two openings of the suds container, and with operating elements to select washing, drying, and special programs, wherein with one service element, a program for rinsing out lint balls, which can be carried out independent of a washing or drying program, can be selected

One such washer/dryer is known from DE 43 03 655 A1. In washer/dryers, lint balls can settle in the air duct and condensation duct during the drying process. In the following drying programs, these lint balls are deposited on and soil, the clothes that have just been introduced in particular, with differently colored textiles. In order to avoid this, a method of rinsing the lint balls from the particularly greatly affected condensation duct is known. The lint balls rinsed from the condensation duct may settle on the outside of the drum on the way through the suds container for discharge, on the suds container walls, on the outside of the drum, and even on the door, due to entrainment, in the following washing programs.

The problem of the invention is to avoid the entrainment of lint balls from the condensation duct into the suds container and thus from the drying process, into the washing process, with a washer/dryer of the type mentioned in the beginning.

In accordance with the invention, this problem is attained by a program-controlled washer/dryer with the features indicated in patent Claim 1. Advantageous developments and refinements of the invention are produced from the subsequent subclaims.

The advantages which can be attained with the invention are found in that, at the request of the user, a complete cleaning of lint balls from the washer/dryer can be undertaken, thus avoiding entrainment of lint balls from one article of clothing to the next.

With washer/dryers having scoop ribs arranged on the drum jacket, which the invention also uses, it has proved advantageous to turn the drum at an rpm n_F at which the water in the suds container is entrained by the scoop ribs to a level of approximately 3/4 of the suds container diameter. In this way, the water is very strongly whirled after attaining the desired level and, in this way, also attains the front surfaces--namely, the door and the drum or suds container back wall. With an increase in the rpm, a complete water jacket, embracing the drum jacket, would be formed, and the cleaning of the front surfaces would stop. At lower rpms, a whirling of the water would not take place. With commercial household washer/dryers, an rpm of ca. 250 min^{-1} has proved to be advantageous (Claim 5).

Moreover, it is particularly advantageous if the drum is turned in both turning directions. In this way, a uniform cleaning of the entire suds container and the drum area takes place (Claim 6).

Furthermore, it is advantageous if the drum is again turned during the emptying of the suds container. In this way, a settling of the lint balls on the suds container jacket during the emptying process is avoided (Claim 7).

An embodiment example of the invention is described, in more detail, below. The washer/dryer, constructed in accordance with the invention, has, in a known manner, a suds container in which a drum is supported in such a way that it can turn. The turning of the drum takes place via a drive motor; the regulation of the motor rpm, via a program control, wherein a microprocessor control is advantageously used. The suds container is constructed in an essentially cylindrical shape and has a removal opening on its front side, which is closed by a door. For the drying, heated air is introduced in the area of the door. The heating and the subsequent moisture removal from the drying air are carried out in a manner known from DE 43 03 655 A1. To improve the wetting of the clothes in the various washing programs, scooping ribs (see, for example, EP 0 304 391 A2) are located on the drum jacket.

The washer/dryer has an operating field with a first rotary dial with which the washing program can be set according to the type of clothes and the temperature. Moreover, special programs that run automatically, such as "Starch," "Spin," "Pump," and "Remove lint balls" can be selected with this rotary dial. A second rotary dial is used to set drying programs, arranged according to the types of clothing and degree of dryness. With push buttons, it is possible to set additional functions ("Pre-washing/Softening," "Short," "Gentle cycle," "Water plus," "Drying/Temperature low"), rpms, and a preliminary starting selection.

The function of the special program "Remove lint balls" is described below:

After the selection of the program, 7.5 to 8 L of water are poured into the suds container in a time-controlled or level-controlled manner, so that the water reaches a filling level to the lower edge of the drum opening. The drum is turned at a washing rpm (ca. 50 min^{-1}). Then, the drum is accelerated, for ca. 60 seconds, to an rpm n_F of 250 min^{-1}. The water is entrained in the lower area of the suds container by the scoop ribs of the drum and forms a water jacket, which extends to a level of 3/4 of the suds container diameter. By the breaking-down of the water jacket at this level, whirlings arise, wherein the door and the drum and suds container back wall are also cleaned. After 60 s, there is a pause of 5 s during in which the drum stops running. Subsequently, a reversal of the turning direction and a renewed acceleration of the drum to 250 min^{-1} for 60 seconds take place. Afterwards, the suds container is emptied with a the drum again turning at a washing rpm (ca. 50 min^{-1}).

Claims

1. Program-controlled washer/dryer with a suds container in which a drum to hold clothes is supported in such a way that it can turn, with a air duct and condensation duct, arranged between two openings of the suds container, and with operating elements to select washing, drying, and special

programs, wherein with an operating element, a program can be selected to rinse out lint balls, which program can be carried out independently of a washing or drying program

characterized in that

the program comprises the following steps:

- Filling the suds container with a prespecified quantity of water

- Turning the drum at an rpm n_F, which is increased, in comparison to the traditional washing rpm n_W, in which the water in the suds container is entrained by the scoop ribs located at the drum wheel, to a level of approximately 3/4 of the suds container diameter.

-Emptying of the suds container.

2. Program-controlled washer/dryer according to Claim 1, characterized in that the quantity of water is measured in such a way that the water level reaches the lower drum edge in the suds container.

3. Program-controlled washer/dryer according to Claim 2, characterized in that the quantity of water is ca. 8 L.

4. Program-controlled washer/dryer according to one of Claims 1 to 3, characterized in that the rpm n_F is between 150 min^{-1} and 350 min^{-1}.

5. Program-controlled washer/dryer according to one of Claims 1 to 3, characterized in that the rpm n_F is 250 min^{-1}.

6. Program-controlled washer/dryer according to at least one of Claims 1 to 5, characterized in that the drum is turned in both turning directions at the rpm n_F.

7. Program-controlled washer/dryer according to at least one of Claims 1 to 6, characterized in that the drum is again turned during the emptying of the suds container.